State of Utah

Department of
Environmental Quality

Dianne R. Nielson, Ph.D.
*Executive Director*

DIVISION OF AIR QUALITY
Richard W. Sprott
*Director*

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*Lieutenant Governor*

DAQE-AN0572017-05

June 23, 2005

Ms. Paula H. Doughty, Manager
Environmental Affairs and Strategic Resources
Kennecott Utah Copper Corporation
8362 West 10200 South
Bingham Canyon, Utah 84006-6001

Dear Ms. Doughty:

Re: Approval Order: Modification to Approval Order DAQE-664-99, Kennecott Tailings Impoundment
Salt Lake County, CDS A, NA, TITLE V, Project Code: N0572-017

The attached document is the Approval Order (AO) for the above-referenced project.

Future correspondence on this Approval Order should include the engineer's name as well as the DAQE number as shown on the upper right-hand corner of this letter. Please direct any technical questions you may have on this project to Mr. Nando Meli. He may be reached at (801) 536-4052.

Sincerely,

Richard W. Sprott, Executive Secretary
Utah Air Quality Board

RWS:RR:NM:dn

cc: Salt Lake Valley Health Department
Mike Owens, EPA Region VIII

# STATE OF UTAH

## Department of Environmental Quality

## Division of Air Quality

# APPROVAL ORDER: MODIFICATION TO APPROVAL ORDER DAQE-664-99, KENNECOTT TAILINGS IMPOUNDMENT

**Prepared By: Nando Meli, Engineer**
**(801) 536-4052**
**Email: Nmeli@utah.gov**

**APPROVAL ORDER NUMBER**

**DAQE-AN0572017-05**

**Date: March 29, 2005**

Kennecott Utah Copper Corporation

**Source Contact**
**Denise Powers**
**Phone: (801) 569-6407**

**Richard W. Sprott**
**Executive Secretary**
**Utah Air Quality Board**

*Abstract*

***Kennecott Utah Copper Corporation (KUCC) has requested that the current Tailings Impoundment Approval Order (AO), DAQE-664-99, be modified to reflect the current Tailings Impoundment area. KUCC is seeking to update the AO to remove the obsolete conditions that pertained to the old Tailings Impoundment Area. Salt Lake County is a Non-attainment area of the National Ambient Air Quality Standards (NAAQS) for $PM_{10}$ and $SO_2$, and is a Maintenance area for Ozone. The KUCC Tailings Impoundment is also included as a regulated $PM_{10}$ source in the Salt Lake County $PM_{10}$ State Implementation Plan (SIP). This AO modification will result in a modification to the existing SIP limits. Therefore, this modification will require approval by the Air Quality Board. Title V of the 1990 Clean Air Act applies to this source. The $PM_{10}$ emissions will decrease in tons per year (tpy) as follows: $PM_{10}$ - 6.94. The changes in emissions will result in the following, in tons per year, potential to emit totals $PM_{10}$ = 36.26.***

The project has been evaluated and found to be consistent with the requirements of the Utah Administrative Code Rule 307 (UAC R307). A public comment period was held in accordance with UAC R307-401-4 and no public comments were received. This air quality Approval Order (AO) authorizes the project with the following conditions, and failure to comply with any of the conditions may constitute a violation of this order.

**General Conditions:**

1. This Approval Order (AO) applies to the following company:

| Site Office | Corporate Office Location |
|---|---|
| Kennecott, Utah Copper Corporation<br>P.O. Box 6001<br>Magna, Utah 84044-6001 | Kennecott, Utah Copper Corporation<br>P.O. Box 6001<br>Magna, Utah 84044-6001 |
| Phone Number: (801) 252-3257<br>Fax Number: (801) 252-3125 | (801) 569-6407<br>(801) 252-3125 |

The equipment listed in this AO shall be operated at the following location:

South of I-80 and West of 8,000 West, Salt Lake City,

Universal Transverse Mercator (UTM) Coordinate System: UTM Datum NAD27
4,513 kilometers Northing, 405 kilometers Easting, Zone 12

2. All definitions, terms, abbreviations, and references used in this AO conform to those used in the Utah Administrative Code (UAC) Rule 307 (R307) and Title 40 of the Code of Federal Regulations (40 CFR). Unless noted otherwise, references cited in these AO conditions refer to those rules.

3. The limits set forth in this AO shall not be exceeded without prior approval in accordance with R307-401.

4. Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved in accordance with R307-401-1

5. All records referenced in this AO which are required to be kept by the owner/operator, shall be made available to the Executive Secretary or Executive Secretary's representative upon request, and the records shall include the two-year period prior to the date of the request. Records shall be kept for the following minimum periods:

   A. Emission inventories Five years from the due date of each emission statement or until the next inventory is due, whichever is longer.

   B. All other records Five years

6. Kennecott Utah Copper Corporation (KUCC) shall operate the Tailings Impoundment Complex in accordance with the terms and conditions of this AO, which was written pursuant to Kennecott's Notice of Intent (NOI) submitted to the Division of Air Quality (DAQ) on November 12, 2004, and additional information submitted on November 24, 2004, and February 7, 2005.

7. Regardless of any inconsistency between conditions of this AO and Section IX, Part H, and Subparts H.2.b.BB.b of Section IX, Part H (Emission Limitations) of the SIP, this AO shall take precedence as provided by R307-305-2.

8. This AO shall replace the AO (DAQE-664-99) dated August 25, 1999.

9. The minimum cycle time required for wetting all interior beach areas of the North Impoundment between February 15 and November 15 shall be at least every four days.

10. If between February 15 and November 15 of each calendar year Kennecott's weather forecast is for a wind speed at more than 25 mph for more than one hour, the procedures listed below shall be followed within 48 hours of issuance of the forecast:

    A. Alert the DAQ promptly.
    B. Continue surveillance and coordination.

**Limitations and Tests Procedures**

11. Visible emissions caused by fugitive dust shall not exceed 10% at the property boundary, and 20% onsite except during periods when wind speeds exceed the value specified in UAC R307-309 and control measures in the most recently approved dust control plan are being taken. The fugitive dust control plan shall utilize the fugitive dust control strategies listed in UAC R307-205 and R307-309. Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9.

**Roads and Fugitives**

12. To minimize fugitive dust emissions at the Tailings Impoundment Complex, magnesium chloride or other stabilization methods approved by the Executive Secretary, shall be applied as necessary on all routinely used, unpaved roadways as discussed in the most recent Tailings Impoundment Fugitive Dust Abatement Program. A copy of the most recent Fugitive Dust Abatement Program is attached to this document as Appendix A. All Fugitive Dust Abatement Programs shall be submitted to the Executive Secretary, attention Major New Source Review Section, for approval. Supplemental stabilization to include

other dust causing activities shall be by water sprays or other methods on an as-needed basis or as determined necessary and approved by the Executive Secretary. The owner/operator shall comply with UAC R307-205 and R307-309.

13. All unpaved roads and other unpaved operational areas that are used by mobile equipment shall be water sprayed and/or chemically treated to control fugitive dust. The application of water or chemical treatment shall be used. Treatment shall be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition. If chemical treatment other than magnesium chloride is to be used, the plan must be approved by the Executive Secretary. Records of water and/or chemical treatment shall be kept for all periods when the plant is in operation. The records shall include the following items:

    A. Date
    B. Number of treatments made, dilution ratio, and quantity
    C. Rainfall received, if any, and approximate amount
    D. Time of day treatments were made

    Records of treatment shall be made available to the Executive Secretary upon request and shall include a period of two years ending with the date of the request.

14. Between February 15 and November 15 of each calendar year, Kennecott shall inspect the interior surface area, unpaved roads, and exterior dike area at least once every two weeks and daily when 48 hours before a wind event, wind gusts are forecasted to exceed 25 mph for more than one hour by Kennecott's station on top of the Tailings Impoundment or the Salt Lake International airport.

15. On the North Tailing Impoundment Kennecott shall conduct wind erosion potential inspections monthly between February 15 and November 15. The tailings distribution system consisting of the North Tailing Impoundment shall be operated to maximize surface wetness. Wind erosion potential is the area that is not wet, frozen, vegetated, crusted or treated and has the potential for wind erosion. No more than 50 contiguous acres or more than 5% of the total North tailings area shall be permitted to have the potential for wind erosion. If it is determined that the total surface area with the potential for wind erosion is greater than 5%, or at the request of the Executive Secretary, inspections shall be conducted once every five working days. Kennecott shall immediately initiate the revised inspection schedule and the results reported to the Executive Secretary within 24 hours of the inspection. The schedule shall continue to be implemented until Kennecott measures a total surface with the potential for wind erosion of less than or equal to 5%. If Kennecott or the Executive Secretary, determines that the percentage of wind erosion potential is exceeded, Kennecott shall meet with the Executive Secretary, or Executive Secretary’s staff, to discuss additional or modified fugitive dust controls/operational practices, and an implementation schedule for such, within five working days following verbal notification by either party.

16. On the closed South Tailings Impoundment Kennecott shall conduct wind erosion potential inspections on inactive non-reclaimed areas monthly between February 15 and November 15. No more than 50 contiguous acres or more than 5% of the South Tailings impoundment tailings area shall be permitted to have the potential for wind erosion. Wind erosion potential is the area that is not wet, frozen, vegetated, crusted or treated and has the potential for wind erosion. Inactive but non-reclaimed areas are to be stabilized by chemical stabilizing agents, ponded water, sprinklers, vegetation or other methods of

fugitive dust control. If it is determined by Kennecott or the Executive Secretary, that the total surface area with the potential for wind erosion is greater than 5% of total tailings area, or at the request of the Executive Secretary, inspections shall be conducted once every five working days. Kennecott shall immediately initiate the revised inspection schedule and the results reported to the Executive Secretary within 24 hours of the inspection. The schedule shall continue to be implemented until Kennecott measures a total surface with the potential for wind erosion of less than or equal to 5% total tailings area. If Kennecott or the Executive Secretary, determines that the percentage of wind erosion potential is exceeded, Kennecott shall meet with the Executive Secretary, or Executive Secretary's staff, to discuss additional or modified fugitive dust controls/operational practices, and an implementation schedule for such, within five working days following verbal notification by either party.

17. Kennecott shall control the fugitive dust on all areas that have been closed for future tailings discharge and/or shutdown

    A. The fugitive dust shall be controlled by reclaiming, revegetation, and/or by another plan that has been approved by the Executive Secretary.

    B. If a temporary or permanent shutdown occurs that would affect any area of the Kennecott Tailings Impoundment, Kennecott shall follow the dust control procedures in Condition 17.A for all areas of the Tailings Impoundment and shall submit a final dust control plan for all areas of the Tailings Impoundment to the Executive Secretary, attention Major New Source Review Section, for approval at least 60 days prior to the planned shutdown.

    C. If the final reclamation plan meets both the Division of Air Quality and the Division of Oil, Gas and Mining requirements, then no further reclamation will be required.

18. Exterior tailings impoundment areas determined by Kennecott or the Executive Secretary to be sources of excessive fugitive dust shall be stabilized through vegetation cover or other approved methods. The exterior tailings surface area of the North Impoundment shall be re-vegetated or stabilized so that no more than 5% of the total exterior surface area shall be subject to wind erosion.

19. On the North Tailings Impoundment, as the embankment cells are filled during continual raising of the embankment, dust shall be controlled by the inherent high water content of the hydraulically placed cyclone underflow. Portions of the embankment that are not under active construction shall be kept wet by applying tackifiers or water pumped from the toe ditch. Newly formed exterior slopes shall be stabilized with tackifiers or vegetation. Vegetation shall be planted during the next appropriate planting season.

20. Disturbed or stripped areas of the North Tailings Impoundment shall be kept sufficiently moist during the project to minimize fugitive dust. This control, or other equivalent control methods, shall remain operational during the project cycle and until the areas have been reclaimed. The control methods used shall be operational as needed 24 hours per day, 365 days per year or until the area has been reclaimed.

21. On a quarterly basis, Kennecott shall summarize the following fugitive dust abatement program activities for the Executive Secretary:

A. Documentation of the wind direction and speed data for days that winds exceeded 25 mph for a period greater than one hour during which no precipitation occurred.

B. Documentation of the inspections of the tailings surface area, including the wind erosion potential of the tailings surface area.

C. Documentation showing areas of dust suppressant application and planting during the quarter.

D. Quarterly reports shall be submitted to the Executive Secretary within 30 days following the end of each calendar quarter.

22. Kennecott shall give periodic updates, as requested by the Executive Secretary concerning the status of the tailings impoundment.

23. When it is determined by Kennecott or the Executive Secretary, that additional tailings dust control beyond the above should be considered or tailings Impoundment operational problems are occurring, Kennecott shall meet with the Executive Secretary, or Executive Secretary's staff, to discuss proposed fugitive dust controls and implementation schedule within five working days after verbal notification by either party.

**Records & Miscellaneous**

24. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this AO including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Executive Secretary which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded.

25. The owner/operator shall comply with R307-150 Series. Inventories, Testing and Monitoring.

26. The owner/operator shall comply with R307-107. General Requirements: Unavoidable Breakdowns.

The Executive Secretary shall be notified in writing if the company is sold or changes its name.

This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including R307.

A copy of the rules, regulations and/or attachments addressed in this AO may be obtained by contacting the DAQ. The Utah Administrative Code R307 rules used by DAQ, the NOI guide, and other air quality documents and forms may also be obtained on the Internet at the following web site: http://www.airquality.utah.gov.

The annual emissions estimations below include point source emissions and do not include fugitive emissions, fugitive dust, road dust, tail pipe emissions and grandfathered emissions. These emissions are for the purpose of determining the applicability of Prevention of Significant Deterioration, non-attainment area, maintenance area, and Title V source requirements of the R307. They are not to be used for determining compliance.

The Potential To Emit (PTE) emissions for the Kennecott's Tailings Impoundment Complex are currently calculated at the following values:

| | Pollutant | Tons/yr |
|---|---|---|
| A. | $PM_{10}$ | 36.26 |

Approved By:

Richard W. Sprott, Executive Secretary
Utah Air Quality Board

# APPENDIX A

## TAILINGS IMPOUNDMENT

## FUGITIVE DUST ABATEMENT PROGRAM

**Revised: July, 2002**

I. INTRODUCTION

This Fugitive Dust Abatement Program prescribes the methods and procedures that Kennecott Utah Copper Corporation (Kennecott) will use to control fugitive dust emissions during construction and operation of the Magna (or South) and North Tailings Impoundments.

As required by the Utah Air Quality Regulations, appropriate steps will be taken during all phases of construction and operation to minimize fugitive dust. Specifically, Condition II.B.1.f. of the Division of Air Quality (DAQ) Title V Operating permit #3500346001, issued February 25, 2000 and revised February 19, 2002, for the North Concentrator, Power Plant, Lab, Tailings Impoundment states:

"Visible emissions caused by fugitive dust shall not exceed 10% at the property boundary, and 20% onsite except during periods when wind speeds exceed 25 miles per hour and control measures in the most recently approved dust control plan are being taken. The fugitive dust control plan shall consider fugitive dust control strategies listed in R307-309-4, including but not limited to: wetting or watering; chemical stabilization; enclosing or covering operation; reducing vehicular speed; etc. [Authority granted under R307-309-3(1) & R307-309-4(3); condition originated in R307-309-3(1) & R307-309-4(3)]"

To comply with these requirements, Kennecott proposes to utilize the dust suppression and control methods described below. Key elements of the dust abatement program will include:

· Minimizing surface disturbances.

· Minimizing dusting exposure periods before dust abatement measures are applied.

· Use of a peripheral tailings discharge system.

· Wetting of surfaces with water or tailings slurry as appropriate.

· Application of chemical dust suppressants.

· Vegetating inactive areas with long-term potential for dust generation.

· Use of hydro mulching and biosolids.

· Subdividing the impoundment into smaller, more manageable areas for reclamation activities.

Kennecott will comply with all applicable requirements of the most current Title V Permit.

## II. MAGNA (or SOUTH) IMPOUNDMENT OPERATION and CLOSURE

### Magna (or South) Tailings Impoundment Transition: 1997 – 2004

Transitioning off the Magna (or South) Tailings Impoundment involves phased revegetation coordinated with downsizing of the peripheral discharge system. This transition is described below.

Revegetation plan: The revegetation goal is to establish a self-sustaining vegetative cover for long-term dust control, stability, and wildlife habitat. Kennecott conducts an ongoing revegetation program to vegetate the exterior side slopes and stepback dikes of the Magna (or South) Tailings Impoundment. This program has been in operation for many years, and has produced a vigorous community of grasses, forbs, shrubs, and trees.

Because the top surface of the Magna (or South) Tailings Impoundment is large, the revegetation plan calls for subdivision of the surface into smaller, more manageable areas. These areas are in the process of being revegetated in a systematic, sequential manner, while tailings continue to be deposited onto the unrevegetated beach areas to control dust. Revegetation of the top of the impoundment began by building the first of a series of approximately 6 to 10 foot-high main revegetation dikes to separate the area to be revegetated from operational areas, and to provide access across the impoundment surface. Main revegetation dikes and subdivided revegetation areas are shown on the attached map.

Revegetation began in 1997 and should be completed by the end of 2004. On the map, the Area Number indicates the revegetation sequence for the main reclamation areas, with Letters indicating the smaller subdivided areas and revegetation sequence. Revegetation began in the western portion of the impoundment and will proceed towards the decant pond in the northeast corner. This will allow adequate time for the decant pond, which contains saturated slimes, to consolidate prior to revegetation.

While the revegetation dikes are constructed to isolate each revegetation area (the subdivided areas average approximately 200 acres in size), the tailings spigotting or peripheral discharge system will remain in place until successful vegetation is established. The main revegetation dikes have been located to take maximum advantage of the surface wetting provided by the existing peripheral spigotting system. The actual alignment of the dikes will be adjusted in the field to suit conditions.

Prior to planting, the sections of the spigotting system in the revegetation area will be sequentially shut off and the revegetation area will be planted using direct seeding. As areas with poor trafficability are identified, smaller access roads will be built out from the main dike, or a low ground pressure crawler type tractor (commonly referred to as a “swamp buggy”), or other suitable equipment will be used to allow access for hydroseeding or drill seeding equipment or application of tackifier. Construction of the main reclamation dikes and smaller access roads are substantial construction projects that require weeks to months to complete. A dust control agent (tackifier) may be applied if planting does not occur promptly.

An irrigation sprinkler system to control dust and improve vegetative growth has also been purchased and installed that is capable of sprinkling 300 acres. The system will use water piped from the Utah-Salt Lake Canal to ensure adequate water quality for maximum plant growth. It is anticipated the sprinkler system will only be used when it is desired to establish vegetation during summer months. The system can also be used for future irrigation of areas utilized for cattle grazing.

Typically, completion of revegetation dikes, shutting off of spigot sections, and planting will be carried out in the late fall, winter, or spring, since germination and establishment of a vegetative crop are more successful when planting is done to take advantage of winter and spring moisture. The tailings surface

may require scarifying prior to planting to break up the surface to allow the drill seeding equipment to penetrate the surface layer to attain proper seed depth.

The revegetation seed mixes to be used to establish vegetation will be those that have been successful to date on Kennecott's Magna (or South) Tailings Impoundment. Fast growing cereal rye grasses and salt tolerant species will be planted. Establishment of a vegetative cover will provide long-term dust control.

Transitional usage of peripheral discharge system on Magna (or South) Tailings Impoundment: As revegetation progresses from west to east, unused portions of the existing peripheral spigotting system will be relocated to the main revegetation dikes so that wetting of the entire unrevegetated surface of the impoundment will continue. Since tailings storage shifted to the North Impoundment in 1997, the peripheral spigotting system continues to wet unrevegetated surfaces of the Magna (or South) Tailings Impoundment. Thus, Kennecott will continue to use the peripheral discharge system for fugitive dust control on the Magna (or South) Tailings Impoundment during establishment of vegetative cover.

Roadways

Roads are maintained using water trucks and graders. Magnesium chloride or other dust suppressants are applied to all road surfaces every spring and reapplied as necessary to minimize dust. Water trucks patrol the roads during appropriate seasons to maintain the moisture content and effectiveness of the dust suppressants. Graders periodically work the road surface to prevent potholes and ruts that can contribute to dust emissions. Unused roads are eliminated where possible and the areas seeded.

## III. NORTH IMPOUNDMENT OPERATIONS

North Impoundment operations began in late 1997. Operations are scheduled to continue until approximately 2027, with a final impoundment height of approximately 250 feet. Kennecott utilizes fugitive dust control measures during operation of the North Impoundment patterned after the successful methods used at the Magna (or South) Tailings Impoundment. A peripheral discharge or spigotting system, similar to the Magna system, is the most significant element of the fugitive dust abatement program. In addition, dust emissions from the embankment are initially controlled by the high water content of the hydraulically placed embankment raising material. Portions of the top of the embankment that are not undergoing active dike raising are kept wet by a sprinkler system utilizing water from the toe ditch. Successive raises of the embankment will be treated with a dust suppressant as needed, periodically wetted, and vegetated during the next planting season. These measures are described in greater detail below.

Peripheral Discharge System

Approximately 80 percent of the total tailings flow (all tailings, except the portion used for embankment construction) is normally spigotted across the North Impoundment surface. A peripheral discharge system similar to that used in the Magna (or South) Tailings Impoundment has been installed along the perimeter of the North Impoundment embankment to control dust emissions from the impoundment surface. Except during extremely cold weather, during pipeline relocation, and during periods of upset conditions, the system will distribute tailings not used for embankment construction across the entire surface of the impoundment. The peripheral spigotting system consists of the following main components:

· Pipelines deliver tailings to the perimeter of the North Impoundment along the toe dike to both the western half of the impoundment, and the eastern half. These pipelines can transport whole tailings and cyclone overflow material.

· Eight header pipelines receive the combined flow of approximately 30,000 gpm from these perimeter lines on the toe dike and convey them along the eight header dikes to the crest of the embankment.

· Spigot lines sequentially distribute tailings (whole tailings and/or cyclone overflow) along the full length of the embankment crest across the impoundment surface.

The eastern and western halves of the system are capable of simultaneous or independent operation. During normal operations, the system sequentially distributes tailings so that the full impoundment surface is wetted frequently. The system is sequenced to distribute flow evenly along the entire perimeter of the impoundment and to maximize surface wetness. The cycle time to distribute tails around the entire perimeter is four days.

During cold-weather periods, while pipelines are relocated, and during upset conditions, tailings may be deposited through single-point discharges.

Main Embankment Raises During Operations

Typically, the North Impoundment embankment is constructed only during non-freezing months (March through November). Embankment construction is sequenced to maintain the embankment surface above the tailings deposited into the interior of the impoundment. The North embankment is constructed utilizing underflow sand produced at two cyclone stations. This material is produced at a rate of approximately 39,000 tons per day, 270 days per year. The underflow sand consists of the coarse (< 25% passing #200 sieve) portion of the tailings stream. The underflow is deposited into hydraulic deposition "cells," where the material is decanted, spread, and compacted in lifts. The North embankment is divided into a series of 16 cells. The embankment construction sequence is as follows: Six cells are actively being constructed during any given period. Three of the six active cells receive underflow deposition simultaneously for approximately twelve hours and then the deposition is switched to the other three cells. The inactive ten cells have large sprinklers installed to keep the areas wet. After approximately 2-4 months, the six active and ten inactive cells are switched and the sprinkler system relocated. Additional sprinklers have been installed in the East Abutment berm area.

To prevent dust generation from the exterior embankment slopes, the surface is sprayed with a polymer dust suppressant agent as necessary so that the dust suppressant maintains its effectiveness. Newly raised slopes will be planted with a rapidly growing cereal grass by including seed in the tackifier application. If the slope is still exposed the following year, another seeding pass will be made to overplant. Polymer will be used in areas where vegetative growth is insufficient to control dust.

Roadways

The North Impoundment is served by a main access road encircling the perimeter of the North Impoundment. Service roads along the face of the North Impoundment embankment, the crest of the embankment, and the header dikes are constructed of underflow sands. Access roads, and permanent site roads are maintained using water trucks and graders. Magnesium chloride or other dust suppressants is applied to all road surfaces every spring and reapplied as necessary to minimize dust. Water trucks patrol the roads during appropriate seasons to maintain the moisture content and effectiveness of the dust suppressants. Graders periodically work the road surface to prevent potholes and ruts that can contribute to dust emissions.

North Impoundment Revegetation Plan

The North Impoundment revegetation plan is similar to the revegetation program for the Magna Tailings Impoundment. The large top surface of the North Impoundment will be subdivided into smaller, more manageable areas through the construction of revegetation dikes. These areas will be revegetated in a systematic, sequential manner, while tailings continue to be deposited onto the unrevegetated areas to control dust. Revegetation will be scheduled to begin on the eastern third of the impoundment. Activity will then move towards the west over the next several years. This will avoid interference with the Copperton single-point discharge on the western side of the impoundment while tailings are still being produced. The decant pond will be the last area to be revegetated within the impoundment.

The revegetation steps and seed mixes to be used to establish revegetation on the North Impoundment will be those that have been successfully used on the Magna Impoundment. Establishment of a vegetative cover will provide long-term dust control.

Phase II Drain Blanket Construction

The North Impoundment embankment construction sequence is designed to be constructed in three zones. The ultimate embankment height will be 245 feet. The existing zone (Zone A) has a base width of approximately 675 feet. Future zones B and C are located downstream of Zone A in the Phase II drain blanket area (405 feet wide). The drain system for Phase II has not yet been constructed.

Based on current mine planning and material balance considerations, the Zone B embankment construction is scheduled to begin in March 2004. This schedule would require the Phase II drain system to be constructed during the summer of 2003. The current Phase II design includes construction of a haul road for hauling slag aggregate from the slag yard located west of the tailings impoundment.

Dust control for this project will include water, magnesium chloride or other chemical dust suppressants as necessary to minimize fugitive dust on roadways. Embankment construction will utilize methods previously discussed (page 7).